

Borehole

**30-01-09****Log Event A****Borehole Information**

|                         |                                 |                                 |
|-------------------------|---------------------------------|---------------------------------|
| Farm : <u>C</u>         | Tank : <u>C-101</u>             | Site Number : <u>299-E27-58</u> |
| N-Coord : <u>42,719</u> | W-Coord : <u>48,373</u>         | TOC Elevation : <u>647.25</u>   |
| Water Level, ft :       | Date Drilled : <u>4/30/1970</u> |                                 |

**Casing Record**

|                            |                                |                    |
|----------------------------|--------------------------------|--------------------|
| Type : <u>Steel-welded</u> | Thickness, in. : <u>0.280</u>  | ID, in. : <u>6</u> |
| Top Depth, ft. : <u>0</u>  | Bottom Depth, ft. : <u>100</u> |                    |

**Borehole Notes:**

This borehole was drilled in April 1970 and completed to a depth of 100 ft with 6-in. casing. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. No information was available that indicated the borehole was perforated or grouted; therefore, it is assumed that the borehole was not perforated or grouted. The top of the casing, which is the zero reference for the SGLS, is even with the tank farm ground surface.

**Equipment Information**

|                                   |   |  |
|-----------------------------------|---|--|
| Logging System : <u>2</u>         | Detector Type : <u>HPGe</u>               | Detector Efficiency: <u>35.0 %</u>     |
| Calibration Date : <u>10/1996</u> | Calibration Reference : <u>GJO-HAN-13</u> | Logging Procedure : <u>P-GJPO-1783</u> |

**Log Run Information**

|                                 |                                  |                                    |
|---------------------------------|----------------------------------|------------------------------------|
| Log Run Number : <u>1</u>       | Log Run Date : <u>03/24/1997</u> | Logging Engineer: <u>Bob Spatz</u> |
| Start Depth, ft.: <u>97.5</u>   | Counting Time, sec.: <u>100</u>  | L/R : <u>L</u> Shield : <u>N</u>   |
| Finish Depth, ft. : <u>39.0</u> | MSA Interval, ft. : <u>0.5</u>   | Log Speed, ft/min.: <u>n/a</u>     |

|                                 |                                  |                                    |
|---------------------------------|----------------------------------|------------------------------------|
| Log Run Number : <u>2</u>       | Log Run Date : <u>03/25/1997</u> | Logging Engineer: <u>Bob Spatz</u> |
| Start Depth, ft.: <u>40.0</u>   | Counting Time, sec.: <u>100</u>  | L/R : <u>L</u> Shield : <u>N</u>   |
| Finish Depth, ft. : <u>29.0</u> | MSA Interval, ft. : <u>0.5</u>   | Log Speed, ft/min.: <u>n/a</u>     |

|                                 |                                  |                                    |
|---------------------------------|----------------------------------|------------------------------------|
| Log Run Number : <u>3</u>       | Log Run Date : <u>03/25/1997</u> | Logging Engineer: <u>Bob Spatz</u> |
| Start Depth, ft.: <u>30.0</u>   | Counting Time, sec.: <u>100</u>  | L/R : <u>R</u> Shield : <u>N</u>   |
| Finish Depth, ft. : <u>26.5</u> | MSA Interval, ft. : <u>0.5</u>   | Log Speed, ft/min.: <u>n/a</u>     |

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|                     |             |                      |                   |                     |                   |
|---------------------|-------------|----------------------|-------------------|---------------------|-------------------|
| Log Run Number :    | <u>4</u>    | Log Run Date :       | <u>03/25/1997</u> | Logging Engineer:   | <u>Bob Spatz</u>  |
| Start Depth, ft.:   | <u>27.5</u> | Counting Time, sec.: | <u>100</u>        | L/R : <u>L</u>      | Shield : <u>N</u> |
| Finish Depth, ft. : | <u>0.0</u>  | MSA Interval, ft. :  | <u>0.5</u>        | Log Speed, ft/min.: | <u>n/a</u>        |

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**Analysis Information**

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Analyst : D.L. ParkerData Processing Reference : P-GJPO-1787Analysis Date : 06/27/1997**Analysis Notes :**

This borehole was logged by the SGLS in four log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation. No fine gain adjustments were necessary during these log runs.

The interval from 26.5 to 30 ft was logged using real time because the dead time exceeded 50 percent in this interval. Real time is a data acquisition method in which the data are gathered at each depth for a set period of time, in this case 100 seconds, and then the data is corrected for the dead time measured at each depth. This method allows data to be collected in relatively high activity zones using short counting times where, under normal circumstances, the short counting times would produce high uncertainty in the data.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides Cs-137, Co-60, Eu-152, and Eu-154 were detected. Cs-137 contamination was measured continuously from the ground surface to 6 ft, almost continuously from 9 to 16.5 ft, continuously from 24.5 to 32 ft, continuously from 34.5 to 37 ft, and at the bottom of the logged interval (97.5 ft). The largest Cs-137 plume occurred from 24 to 32 ft. Co-60 contamination was detected at 39.5 and 40 ft. Eu-152 and Eu-154 were both detected at 27.5 ft.

A thin zone of slightly higher K-40 concentrations occurs from 38 to 40.5 ft, and a gradual increase in K-40 concentrations occurs from 59.5 ft to the bottom of the logged interval.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank C-101.

**Log Plot Notes:**

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the



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spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A plot of representative historical gross gamma-ray logs from 1975 to 1992 is included. The headings of the plots identify the date on which the data in the plots were gathered.